

C-5 Avionics Modernization Program (AMP) and Reliability Enhancement and Re-engining Program (RERP)

SUMMARY

- DOT&E approved a combined C-5 Modernization Program Test and Evaluation Master Plan (TEMP) in October 2001 prior to the Milestone B review for Reliability Enhancement and Re-Engining Program (RERP).
- There are high schedule and capability risks for the C-5 Avionics Modernization Program (AMP) development and test programs. Full C-5 modernization depends upon the success of the AMP to enable the RERP.
- Generating test sorties, correcting software deficiencies, and completing required developmental test points continue to hamper AMP progress toward IOT&E. The final impacts to the AMP capabilities, the IOT&E schedule, and the RERP development timeline indicate the scheduled AMP IOT&E is at risk and will require program restructuring.



The C-5 components perform strategic airlift, emergency aero-medical evacuation, transport of brigade-size forces in conjunction with other organic aircraft, and delivery of outsize/oversize cargo.

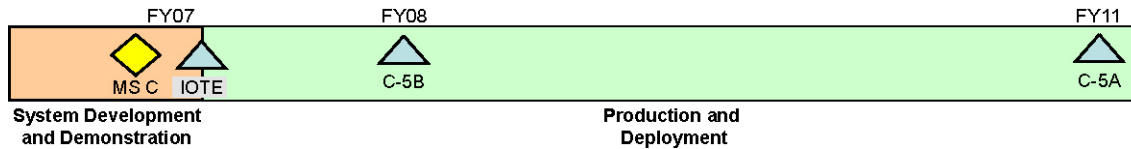
SYSTEM DESCRIPTION AND MISSION

The C-5 is DoD's largest transport aircraft. Air Force active, reserve, and National Guard components perform strategic airlift, emergency aero-medical evacuation, transport of brigade-size forces in conjunction with other organic aircraft, and delivery of outsize/oversize cargo. The C-5 must perform global missions at night and in adverse weather, and be capable of receiving fuel in-flight. C-5As, built in the late 1960s, constitute approximately 60 percent of the 118-aircraft fleet at the end of FY04. C-5Bs were delivered in the 1980s.

C-5 modernization includes two sequential modifications, the AMP and the separate RERP. Full modernization incorporates a "glass cockpit" with digital avionics, as well as state-of-the-art communications, navigation, and surveillance/air traffic management functionality. It includes commercial engines, nacelles, thrust reversers, and pylons, plus extensive reliability improvements. The anticipated performance improvements are intended to optimize cargo-carrying capabilities, to include takeoffs and landings of fully-loaded aircraft on relatively short runways, and to meet the performance requirements of worldwide air traffic management initiatives. Additionally, the re-engining is intended to provide significant reliability, maintainability, and availability improvements. Other candidate sub-systems for reliability enhancement include the flight controls, hydraulics, environmental controls, electrical, and fuel system components.

AIR FORCE PROGRAMS

TEST AND EVALUATION ACTIVITY



A test team that includes contractor and government personnel performing combined developmental and operational testing is located at the contractor facility in Marietta, Georgia. Co-locating Air Force developmental and operational test and evaluation teams at the factory has increased test efficiency, but the test duration has expanded due to developmental deficiencies. C-5 AMP laboratory and flight tests are behind schedule.

The first flight of a C-5 AMP aircraft (a B model) was accomplished in December 2002. A second AMP test aircraft (an A model) flew in August 2003. Software installation was originally planned to occur in four versions. Flight testing of versions 1.1 and 1.2 is complete. Only 61 percent of the test points for version 2.1 were accomplished, before moving on to version 2.2. From May 4 - June 19, 2004, flight testers scheduled three sorties per week, flew an average of 1.86 sorties per week, and accomplished 1.43 effective sorties per week. Generating test sorties, correcting software deficiencies, and completing required test points continue to hamper AMP development. The impacts to the AMP IOT&E schedule and the RERP development timeline indicate the scheduled AMP IOT&E is at risk and will require program restructuring.

The Air Force is currently conducting fire suppression system testing. The program completed the Man-Portable Air Defense System hardware-in-the-loop susceptibility tests in July 2004; data analyses are ongoing.

DOT&E approved a C-5 TEMP in October 2001, prior to a Milestone B review. We require an update to the TEMP before the start of AMP IOT&E.

TEST AND EVALUATION ASSESSMENT

Schedule and capability risks for the C-5 AMP development and test programs remain high. A proposal to complete AMP development in December 2004 could leave AMP-only aircraft without needed capabilities and could consume resources intended to increase aircraft reliability under RERP. If the AMP modifications are not completed as planned, the RERP schedule and capabilities will suffer further adverse impacts. C-5 modernization depends upon the success of AMP to enable RERP.

A preliminary reliability demonstration, included as part of the RERP IOT&E, is required prior to the RERP full-rate production decision. In the current TEMP, four aircraft are to fly approximately 200 sorties for approximately 800 flying hours between IOT&E and the reliability demonstration. Due to funding issues, the number of aircraft for developmental testing was reduced to three. This impacts the number of aircraft available for IOT&E. In order to assess the impact to IOT&E, AFOTEC is developing a model and the Air Mobility Command is providing field data. This model will be used to verify IOT&E planning and the viability of a three-aircraft reliability evaluation.